

(19)



(11)

EP 1 235 530 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
22.07.2009 Bulletin 2009/30

(21) Application number: **00980164.8**

(22) Date of filing: **08.11.2000**

(51) Int Cl.:
A61C 13/00 (2006.01)

(86) International application number:
PCT/SE2000/002180

(87) International publication number:
WO 2001/037756 (31.05.2001 Gazette 2001/22)

(54) **ARRANGEMENT FOR A SYSTEM FOR MANUFACTURING DENTAL PRODUCTS**

ANORDNUNG FÜR EIN SYSTEM ZUR HERSTELLUNG DENTALER PRODUKTE

AGENCEMENT DESTINÉ A UN SYSTEME DE FABRICATION DE PRODUITS DENTAIRE

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**

(30) Priority: **26.11.1999 SE 9904275**

(43) Date of publication of application:
04.09.2002 Bulletin 2002/36

(73) Proprietor: **Nobel Biocare AB (publ)
402 26 Göteborg (SE)**

(72) Inventors:
• **ANDERSSON, Matts
S-443 39 Lerum (SE)**
• **TÖRNQUIST, Anders
S-433 67 Partille (SE)**

(74) Representative: **Byström, Kurt Linus et al
Nobel Biocare AB
Box 5190
402 26 Göteborg (SE)**

(56) References cited:
WO-A1-98/44865

EP 1 235 530 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

TECHNICAL FIELD

[0001] The present invention relates to an arrangement for manufacturing dental products made of tissue compatible material.

PRIOR ART

[0002] Reference is made to WO 98/44865 which relates, inter alia, to an advanced and effective manufacturing system in accordance with the above. In this system, the customers concerned can order products of a technically complex nature and of individual configurations. In accordance with the concept of the system, dentists or dental technicians will themselves be able to execute a query profile for the ordered article. The query form can include information on scanning of a given plaster model, scanning of a given dental situation in a patient's mouth, completion of technical dental data, patient information, details concerning the tooth or tooth part which is to be restored, identification details, type of work the customer wishes to have done by the advanced system PROCERA®, etc. The information can be processed by the dentist and/or dental technician for compilation in a data file with the aid of a program which is used in PROCERA®. Order forms and their transmission can then be effected. It will be appreciated that the advanced manufacturing system PROCERA® is of an especially advanced nature and the system must be able to receive orders from a number of customers and identify the query profiles and produce all or part of the dental products in question and/or give information on how such production can be effected outside the actual PROCERA® system. The coordinating units represent receiving units for the orders and administer the received orders and forward their contents to the production units. The system is designed so that coordinating units can be exchanged and/or added to. The coordinating units work with computers and modem/ISDN connections, and it is within the scope of the known system to be able to arrange computers with different computer power and with different numbers of the said type of connections. In one embodiment, the coordinating unit is constructed as a local network.

[0003] The production units thus work with databases to which the coordinating units have access and can cooperate with the production units. The databases work with programs controlling the database contents, and it must be possible for different types of data to be distributed effectively within the system.

DISCLOSURE OF THE INVENTION

TECHNICAL PROBLEM

[0004] Systems for manufacturing individually and ex-

tremely accurately designed dental products/tools are characterized by advanced mechanical constructions and the receipt, distribution and return of large quantities of data to/from the system. Given the complexity and range, the same basic equipment must be able to be used despite constant modernizing and updating requirements placed on system and software. The invention solves this problem, among others.

[0005] The advanced manufacturing and information system PROCERA® which is available on the market for provision of advanced individual dental products and provision of information is characterized by a growing network of customers who wish to access the system as subscribers or to use this system for more occasional uses. The system must have a structure permitting constantly increasing (powerful) connection of customer numbers despite the already existing large quantities of data being handled by and distributed within the system. The invention solves this problem too.

[0006] In this type of system, it must be possible for updating and improvements to be made done continuously without affecting or disrupting the system. The invention solves this problem too.

[0007] In accordance with the above, the system includes databases whose data contents and process-controlling programs have to be updated, changed, improved, etc. To do this, use is made of, inter alia, the abovementioned data replication which involves only relevant data or changes being transmitted to the databases for their adaptation of the data contents to the last-requested update. The databases and their data contents can be largely identical and each update has relatively little effect on the respective database. For disturbance reduction and efficiency of the system, it is necessary that the latter can be designed for or with effective data replication function. The invention solves this problem too.

[0008] A large quantity of data can arise if the technical dental information is to be based on scans in cartesian systems (CAD/CAM), or if the information is to be sent across the Internet and/or IBM network, or if the number of customers is particularly high, which is possible in the case of national systems in which users at widely dispersed locations can be connected to the system.

[0009] Certain allocation sequences have previously been made in the updating procedure. The effects from these allocations can be considerably reduced or entirely eliminated by means of the invention.

[0010] The use of transport servers for new databases in system constructions needs to be avoided.

SOLUTION

[0011] The invention is defined by independent claim 1.

[0012] In an arrangement according to the invention the data contents and any program contents in the databases of the production units are entered in memory el-

ements, and that the memory elements are arranged for external accessing of data contents or program contents upon or for implementation of the said data replications via one or more connections or external interfaces, via which the data replications can be effected.

[0013] The databases of the production units have essentially the same or corresponding contents and the same applies to the controlling program contents in the different databases. In one embodiment, the data replications can be effected by means of essentially parallel actuations of data contents or controlling program contents in the memory elements of the databases. Alternatively, updating can take place sequentially in the different memory elements, or updating of first content items can be updated before second content items, etc.

[0014] The inventive concept allows after each data replication has been effected, the said coordinating units can be run together with the databases of the production units with respect to manufacture, system administration, etc. In one embodiment, the data contents in the databases can relate to arrival of data files initiated by the orderer, finance details relating to costs connected with the given product, data file contents, file preparations, product administration, milling or ceramic material registration and/or orderer addresses. The said data contents can thus be acted on by the updated controlling program contents. The production units can be connected to transport servers. The databases of the production units can preferably comprise data contents related to ceramic production of products, for example caps, where the data contents also relate to the composition of the ceramic material, the selection and/or treatment upon production. The contents of the databases can differ between different ceramic materials of different types or manufacturers. In one embodiment, the contents of the databases are related to semi-finished products (i.e. only part of the product is manufactured) which are intended for cooperation with further products or tools produced in the system, for example a ceramic cap whose production is based on the design of the tool punch.

ADVANTAGES

[0015] The features which have been proposed above provide possibilities for an effective and economically advantageous updating function in the system which, as a result, can be constantly expanded within wide limits and for large resources, without the normal operation of the system needing to be disrupted or interrupted on account of the updates, which can be constantly repeated or can be substantially continuously ongoing. Connection to and cooperation with coordinating units included in the system can take place in the system after each update or change to the system. The invention permits more long-lasting efficiency and speed of updating and system expansion. The existing contents of the databases can be added to and modified within wide limits. Conventional programs and programming languages can be used for

the function and administration controls within the system, whose products can include milled products/tools, pressed and sintered ceramic caps, etc. Previously conventional techniques can be retained in the system, and thus SQL (Structured Query Language) can be retained and used as the control and administration language. The information contents can relate to scanning of plaster models, dental data, patient, tooth type, ID type, type of work, etc., in accordance with before. The invention permits rapid access to the data contents which are to be data-replicated. On account of the fact that the computer equipment as such does not need to be engaged in hand-shake procedures on requested access to data contents for updating thereof, the problems of disruption and delay in said updates are reduced. A host computer can update the production unit(s). This applies also to the coordinating unit(s). The event tables used are modified and replicated directly across to the other units concerned (serial actuation). Information items or data in the tables are introduced, modified and/or removed, and the amendments in the tables are transferred across to each other in serial actuation within the system. The updates can be effected automatically or at certain time intervals. Reconstructions can therefore be made effectively a short time after crashing. A host computer represents a source and doublet on a database. Each item in the system has a host database in the register database of the production unit. There is also a host database for customer categories, etc. By means of tables which update sequentially and reconstructions of databases, advantages are also achieved from other aspects, such as back-up, dynamics, etc.

DESCRIPTION OF THE FIGURES

[0016] A presently proposed arrangement using the characteristic features of the invention will now be described with reference to the attached drawings, in which:

Figure 1 is a block circuit diagram showing the basic structure of the earlier system, and

Figure 2 is a block circuit diagram showing the interaction between coordinating units and production units and the updating function for table contents/data contents and the control programs in databases of the production units.

DETAILED EMBODIMENT

[0017] In Figure 1, users 1, 2 and 3 can be connected via modem equipment 4, 5 and 6, respectively, to a telephone network and/or computer network, which can entirely or partially comprise the Internet and/or the so-called IBM network. The said customers, who include geographically wide-spread (other ends of a country, other countries, etc.) dentists and/or dental technicians can compile query and order profiles in accordance with the above. The said orders are sent to the advanced central

manufacturing system PROCERA®, which is connected to the network 7 via coordinating units 9 which administer the receipt of the orders. The coordinating unit 9 is provided with modem connections 9a. The coordinating units can be one or more in number, the situation with several coordinating units in Figure 1 being indicated by 10 which symbolizes a second coordinating unit. Further coordinating units can be included in the same way. The coordinating units can cooperate or run together with production units 11, 12 and 13, and the cooperation with these takes place via a local network 14 consisting of a local area network of the LAN type. The production units are connected to the network 14 via connection elements 11a, 12a and 13a, respectively.

[0018] Each customer 1, 2 or 3 can thus initiate a query profile or an order, which for customer 1 has been symbolized by i_1 . Each coordinating unit, for example the coordinating unit 9, receives the order transmitted via the customer's modem 4 and the public network 7, the signal received in the coordinating unit 9 being indicated by i_2 . The coordinating unit 9 receives the orders from the customers, registers these, and effects a distribution within the system which relates to the orders in question. The coordinating unit also has an adapter unit 9b via which the coordinating unit cooperates with and controls the production unit 11, 12 and 13, the output signal from the unit 9b being indicated by i_3 . The production unit 11 in question receives the distribution signal 9 from the coordinating unit concerned, the signal to the unit 11a being indicated by i_4 . The production unit then effects the actual order which can involve a dental product in accordance with the above. The dental product is returned physically to the customer 1 in a manner known per se. Alternatively, the query profile from the customer can include a request for information from the system, and the said information can be returned in the system, for example from the coordinating unit 9 and/or the production unit concerned, e.g. 11. The signals returned in this way are indicated by i_1' , i_2' , i_3' and i_4' .

[0019] Figure 2 shows four coordinating units 9', 10', 10'' and 10'''. The said coordinating units have connection elements 9b', 10b', 10b'' and 10b''', respectively, to the internal or local network 14' (cf. 14 according to Figure 1). Similarly, four production units are indicated by 11', 12', 13' and 13''. The connections to the network 14' are in this case indicated by 11a', 12a', 13a' and 13a''. The production units work with data contents or databases, the database for production unit 11' being indicated by 11d. The other production units are provided with databases which are identical or substantially equivalent to the said database 11d. The database can contain data in different files, for example files with data for file entry, financial data, manufacturing data files, file preparation data, production administration data, milling coordinates registration data, ceramic material selection data, delivery address data, etc. The production units are also assigned memory elements 11c, 12b, 13b and 13b'. The memory elements include data contents and software of

types known per se, in which respect reference is made, inter alia, to SQL databases in accordance with the above. The memory elements are connected directly to the local computer network 14' via connections or interfaces 11e, 12c, 13c and 13c'. These interfaces are thus exposed to the network structure 14'. The databases 11d in the production units are connected to the network 14' via interfaces 11f, 12d, 13d and 13d'.

[0020] The databases in the production units can be regarded as production databases. The coordinating units 9', 10', 10'' and 10''' are provided with so-called application databases which also comprise data contents and use SQL. The application databases in the coordinating units can be run together with the database arrangement in the production units. Thus, the coordinating units can comprise or involve data on finance reports, dental specifications, article index, customer index, client registration, client databases, production modifications. The data in the bases are arranged in tables which must be updated successively by reciprocal serial actuation in a known manner.

[0021] By means of the arrangement proposed above, the data contents or the tables in the databases and their control programs can be updated in an effective manner by means of known data replication functions in the public or local network 14'. The updating or data replication can take place sequentially or successively in the various units concerned. Alternatively, or in addition to this, different parts of the database contents can be replicated before other database parts, etc. The interfaces or connections for the units 9', 10', 10'', 10''' in Figure 2 are symbolized by 9c, 10c, 10c' and 10c'', respectively. The database contents and software in the last-mentioned coordinating units are updated in a manner known per se via their connections or interfaces exposed to the network.

[0022] The system also includes an updating unit 15 (for example one or more host computers) for the said database contents and programs controlling the databases. The unit 15 is provided with a connection unit 15a to the network 14' via an interface 15b. By means of the structure shown, the updating unit 15 has, via its interface, direct access on the one hand to the interfaces 11e, 12c, 13c and 13c', respectively, of the databases in the production units and, on the other hand, to the program contents in the memory elements 11c, 12b, 13b and 13b' via the said interfaces.

[0023] Referring to the embodiment according to Figure 2, the coordinating units 9', 10', 10'' and 10''' can be designed with external memory elements corresponding to those (11c, 12b, 13b, 13b') for the production units. However, memory elements can be arranged internally within the units 9', 10', 10'' and 10''' and are exposed in a similar way to the memory elements of the production units, via the interfaces 9c, 10c, 10c' and 10c'', respectively. Correspondingly, the external memory elements 11c, 12b, 13b and 13b' can be integrated in the production units in the same way as in the case of the coordi-

nating units. In Figure 1, dental products in the form of caps produced by the production units 11 and 12 are indicated by P and P'.

[0024] In Figure 2, a data replication function or data replication start from the updating unit 15 is represented by i_5' . The data replication is directed towards the contents in the memory elements 11c, whose received signals from the public network 14' are indicated by i_6 . In addition to this, the replication can involve updating of the contents in the production unit concerned, for example 11d, the signal received from the network 14' by the production unit in question in this case being designated by i_7 . In addition to this, the databases or software programs in the coordinating units can be updated, the signal received from the public network 14' in this case being indicated by i_8 . In the event of communication taking place in two directions upon replication, the updating unit 15 can receive signals i_5' which have been initiated from i_6' , i_7' and i_8' from the respective element and/or unit concerned. Figure 2 also includes one or more transport servers 16.

[0025] A modification in a table in a first unit 11', 12', 13', etc., or 9', 10', 10'', etc., of the said type can induce replication of the modification across to a second unit of the said listed units, and thereafter replication of the modification across to a third unit of the said units, and so on. A subsequent modification is handled in the same way, and so on. See also the host computer arrangement as described above.

[0026] A data replication in a table can be caused by the event (events) insert, replace, change, in which case the table includes the event number, time of the event, data concerned, why the event takes place, etc. The events can be caused by customer application, system change, etc. The system can operate with order registration, file registration, address registration which gives order events, file/address events, etc., to the coordinating units or a system section (router) which in turn can create follow-up events and product/production events for a user interface in the system. It will be appreciated that a very large number of events are created in the PROCERA® system, given the great machine capacity, customer base, data quantity, etc., with which the system operates. It will also be appreciated that a very large quantity of data is replicated between the different units and that, for example, handshake procedures would not be an economic solution. The large quantity of data is increased with the transmission capacity in the communications systems which can permit information transfer caused by photo and laser scans and CAD/CAM techniques in the machinery producing the products.

[0027] Further events via the product database system between routers in interfaces between which the database is arranged can be finance actions, preparation actions, milling coordinates actions, etc. The system can also include material, product and component registers which need to be updated.

[0028] According to an aspect, a method for a manu-

facturing system 8 for dental products P, P', for example caps, crowns, bridges, etc., made of tissue-compatible material such as ceramic, titanium, etc., in which the system operates with coordinating units 9, 10 in which orders i_1 from system users 1, 2, 3 are received and registered and are distributed to production units 11, 12, 13 which manufacture the products and which are run together with and controlled from the coordinating units as a function of the existing order distribution, and with data replications i_5 for databases 11d which are included in the product units and are updated as a function of events and/or system changes, for example changes to system functions, system applications, system structure, customer categories, etc. The data contained in the databases of the production units are fed to databases with memory elements 11c, 12b, 13b, 13b' which are exposed for accessing the data contents in conjunction with the data replications, and in that at least the most important items of the contents of the databases are arranged to be accessed via one or more connections or interfaces 11e, 12c, 13c, 13c' assigned to the said memory elements, via which the function for data replication in the system is effected.

[0029] According to another aspect, a manufacturing system 8 for dental products, for example caps, ceramics, crowns, bridges, etc., made of tissue-compatible material such as ceramic, titanium, etc., comprises coordinating units 9, 10 which receive and register orders from system users 1, 2, 3 and distribute the orders to production units 11, 12, 13 included in the system. The production units comprise databases 11d whose data contents controlling production and its administration can be subject to data replications i_5 , by means of which events and/or system changes, for example changes to system functions, system application, system structure, customer categories, etc., can be implemented. The data contents in the databases of the production units are entered in memory elements 11c. The memory elements are arranged for accessing data contents upon implementation of the said data replications via one or more connections or one or more interfaces 11e, via which the function for the data replications has access.

[0030] The database 11d of each production unit may have essentially the same contents as the databases of the other production unit or units, and the data contents in the various databases may have corresponding or similar contents.

[0031] For the data replication for a number of given units 11', 12', 13', etc. and 9', 10', 10'', etc. a first unit may receive and register an event, here called first event, the first unit may initiate a second unit of the said unit for replication, the second unit may initiate a third unit of the said units for replication, and so on, and/or a second event may act on the first unit in a renewed event action directly or after a predetermined time, etc.

[0032] The data replications can be effected by means of essentially parallel action i_6 of the data contents in the memory elements 11c of the databases by means of the

occurring event.

[0033] After each data replication execution i5 has been carried out, the said coordinating units 9', 10', 10", 10''' can be run together with databases 11d of the production units with respect to manufacture, system administration, etc.

[0034] The data contents 11d in the databases can be assigned to arrival of data files initiated by the orderer, finance details relating to costs connected with the given product, the data file contents, file preparations, product administration, milling or ceramic registration and/or orderer addresses.

[0035] The databases of the production units may comprise data contents related to ceramic production of products P, P', for example caps, where the contents also relate to the composition and treatment of the ceramic material upon production.

[0036] The contents of the databases may differ between different ceramic materials of different types (manufacturers).

[0037] The data contents of the databases 10d may be related to semi-finished products which are intended for cooperation with further products or tools produced in the system, for example a ceramic cap whose production is based on tool punch.

[0038] The data contents of the production units can be updated via exposed interfaces 11e, 11f, 12c, 12d, 13c, 13c', 13d' from the system's data replication function (s) and/or from the updating unit 15.

[0039] The database contents and/or control software of the coordinating units can be updated via exposed interfaces 9c, 10c, 10c', 10c''' from the system's data replication function(s) and/or from the updating unit 15.

[0040] The updating unit 15 may have an interface which is connected or can be connected to the public telephone and/or computer network 14' of the coordinating units 9', 10', 10", 10''' and the production units 11', 12', 13', 13" .

Claims

1. Arrangement for manufacturing dental products made of tissue compatible material, comprising a manufacturing system (8) for dental products comprising coordinating units (9, 10), which are adapted to receive and register orders from system users (1, 2, 3) and distribute the orders to production units (11, 12, 13) included in the manufacturing system, wherein the production units comprise databases (11d) whose data contents, which is adapted to control production and its administration, is subject to data replications (i5), by means of which events and/or system changes can be implemented, **characterized by** memory elements (11c) adapted to contain the data

contents being fed from the databases of the production units, the data being adapted to control production and its administration, in the databases of the production units, and

an updating unit comprised in the manufacturing system and adapted to start data replication, wherein the memory elements (11c) are accessible via one or more connections or one or more interfaces (11e, 12c, 13c, 13c') by the updating unit, and arranged for accessing the data contents contained in the memory elements upon implementation of the data replication.

2. Arrangement according to claim 1, **characterized in that** the database (11d) of each production unit has essentially the same data contents as the databases of the other production unit or units, and **in that** the data contents in the various databases have corresponding or similar contents.
3. Arrangement according to any of claims 1 or 2, **characterized in that** said coordinating units (9', 10', 10", 10''') are adapted to be run together with databases (11d) of the production units with respect to manufacture and system administration after each data replication execution (i5) has been carried out.
4. Arrangement according to any of claims 1 to 3, **characterized in that** the data contents of the production units can be updated via the exposed interfaces (11e, 11f, 12c, 12d, 13c, 13c', 13d') from the updating unit (15).
5. Arrangement according to any of claims 1 to 4, **characterized in that** the coordinating units comprises databases with database contents and/or control software, which can be updated via the exposed interfaces (9c, 10c, 10c', 10c') from the updating unit (15).
6. Arrangement according to claim 5, **characterized in that** the updating unit (15) has an interface which is connected or can be connected to a public telephone and/or computer network (14') of the coordinating units (9', 10', 10', 10') and the production units (11', 12', 13', 13'').

Patentansprüche

1. Anordnung zur Herstellung von dentalen Produkten aus gewebeverträglichem Material mit einem Herstellungssystem (8) für dentale Produkte mit Koordinierungseinheiten (9, 10), die so ausgebildet sind, dass sie Befehle von Systemnutzern (1, 2, 3) empfangen und registrieren können und die Befehle auf Produktionseinheiten (11, 12, 13), die in dem Herstellungssystem enthalten sind, verteilen können

nen, wobei

die Produktionseinheiten Datenbanken (11d) aufweisen, deren Dateninhalte, die so ausgebildet sind, dass sie die Herstellung und deren Verwaltung steuern können, Datenreplikationen (i5) unverzogen werden, mittels welcher Ereignisse und/oder Systemänderungen implementiert werden können, **gekennzeichnet durch**

Speicherelemente (11c), die so ausgebildet sind, dass sie die Dateninhalte, welche von den Datenbanken der Herstellungseinheiten zugeführt werden, enthalten, wobei die Daten so ausgebildet sind, dass sie die Herstellung und deren Verwaltung steuern können, in den Datenbanken der Herstellungseinheiten, und eine Aktualisierungseinheit, die in dem Herstellungssystem enthalten ist und so ausgebildet ist, dass sie die Datenreplikation starten kann, wobei die Speicherelemente (11c) über eine oder mehrere Verbindungen oder ein oder mehrere Schnittstellen (11e, 12c, 13c, 13c') **durch** die Aktualisierungseinheit zugreifbar sind und angeordnet sind, um auf die Dateninhalte, die in den Speicherelementen enthalten sind, bei Implementierung der Datenreplikation zuzugreifen.

2. Anordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Datenbank (11d) jeder Herstellungseinheit im Wesentlichen die gleichen Dateninhalte wie die Datenbanken der anderen Herstellungseinheit oder -einheiten hat und dass die Dateninhalte in den verschiedenen Datenbanken entsprechende oder ähnliche Inhalte haben.
3. Anordnung nach einem der Ansprüche 1 oder 2, **dadurch gekennzeichnet, dass** die Koordinierungseinheiten (9', 10', 10'', 10''') so ausgebildet sind, dass sie zusammen mit den Datenbanken (11d) der Herstellungseinheiten mit Bezug auf die Herstellungs- und Systemverwaltung laufen, nachdem jede Datenreplikationsausführung (i5) ausgeführt worden ist.
4. Anordnung nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die Dateninhalte der Herstellungseinheiten über die freigelegten Schnittstellen (11e, 11f, 12c, 12d, 13c, 13c', 13d') von der Aktualisierungseinheit (15) aktualisiert werden können.
5. Anordnung nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** die Koordinierungseinheiten Datenbanken mit Datenbankinhalten und/oder Steuerungssoftware aufweisen, die über die freigelegten Schnittstellen (9c, 10c, 10c', 10c') von der Aktualisierungseinheit (15) aktualisiert werden können.
6. Anordnung nach Anspruch 5, **dadurch gekennzeichnet, dass** die Aktualisierungseinheit (15) eine

Schnittstelle hat, die mit einem öffentlichen Telefon und/oder einem Computernetzwerk (14') der Koordinierungseinheiten (9', 10', 10'', 10''') und der Herstellungseinheiten (11', 12', 13', 13'') verbunden ist oder verbunden werden kann.

Revendications

1. Agencement pour la fabrication de produits dentaires réalisés en matières à compatibilité tissulaire, comprenant un système de fabrication (8) pour des produits dentaires comportant:
 - des unités de coordination (9, 10), qui sont adaptées pour recevoir et enregistrer des ordres provenant d'utilisateurs (1, 2, 3) du système et distribuer les ordres vers des unités de production (11, 12, 13) incluses dans le système de fabrication, où
 - les unités de production comprennent des bases de données (11d) dont le contenu en données, qui est adapté pour commander la production et son administration, est soumis à des répliquations de données (i5), au moyen desquelles des événements et/ou des changements au niveau du système peuvent être mis en oeuvre, **caractérisé par**
 - des éléments de mémoire (11c) adaptés pour contenir le contenu en données qui est alimenté à partir des bases de données des unités de production, les données étant adaptées pour commander la production et son administration, dans les bases de données des unités de production, et
 - une unité de mise à jour comprise dans le système de fabrication et adaptée pour commencer la répliquation de données, où
 - les éléments de mémoire (11c) sont accessibles par le biais d'une ou plusieurs connexions ou une ou plusieurs interfaces (11e, 12c, 13c, 13c') par l'unité de mise à jour, et agencés pour avoir accès au contenu en données contenu dans les éléments de mémoire au moment de la mise en oeuvre de la répliquation de données.
2. Agencement selon la revendication 1, **caractérisé en ce que** la base de données (11d) de chaque unité de production a essentiellement le même contenu en données que les bases de données de l'autre ou des autres unités de production, et **en ce que** le contenu en données dans les diverses bases de données ont un contenu correspondant ou similaire.
3. Agencement selon l'une des revendications 1 ou 2, **caractérisé en ce que** lesdites unités de coordination (9', 10', 10'', 10''') sont adaptées pour être dirigées en même temps que des bases de données

(11d) des unités de production par rapport à la fabrication et à l'administration du système après l'exécution de chaque réplication de données (i5).

4. Agencement selon l'une des revendications 1 à 3, **caractérisé en ce que** le contenu en données des unités de production peut être mis à jour par le biais des interfaces exposées (11e, 11f, 12c, 12d, 13c, 13c', 13d') à partir de l'unité de mise à jour (15). 5
5. Agencement selon l'une des revendications 1 à 4, **caractérisé en ce que** les unités de coordination comprennent des bases de données avec un contenu de base de données et/ou un logiciel d'exploitation, que l'on peut mettre à jour par le biais des interfaces exposées (9c, 10c, 10c', 10c') à partir de l'unité de mise à jour (15). 10
6. Agencement selon la revendication 5, **caractérisé en ce que** l'unité de mise à jour (15) possède une interface qui est connectée ou qui peut être connectée à un téléphone public et/ou à un réseau informatique (14') des unités de coordination (9', 10', 10', 10') et des unités de production (11', 12', 13', 13"). 15

20

25

30

35

40

45

50

55

Fig. 1

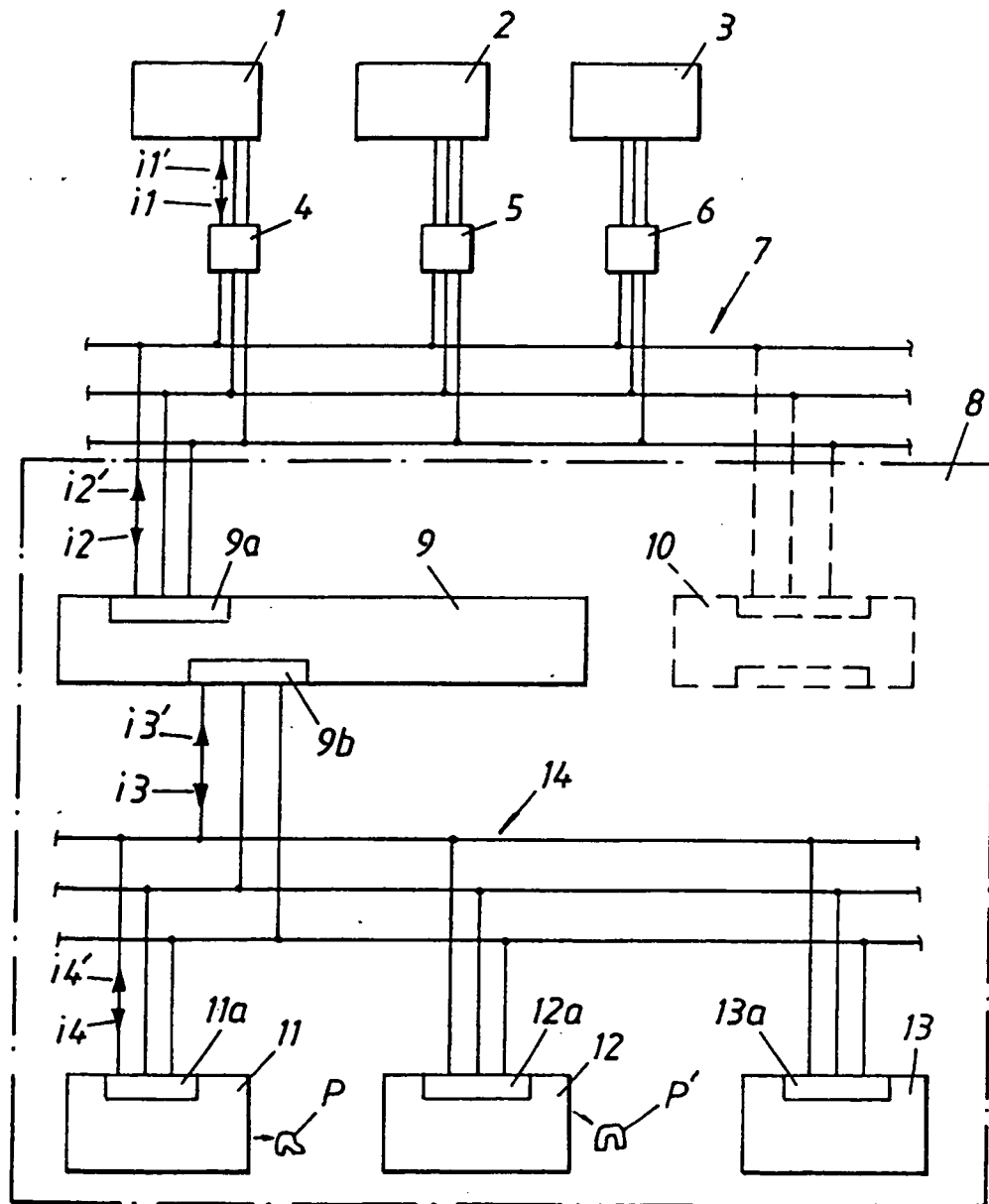
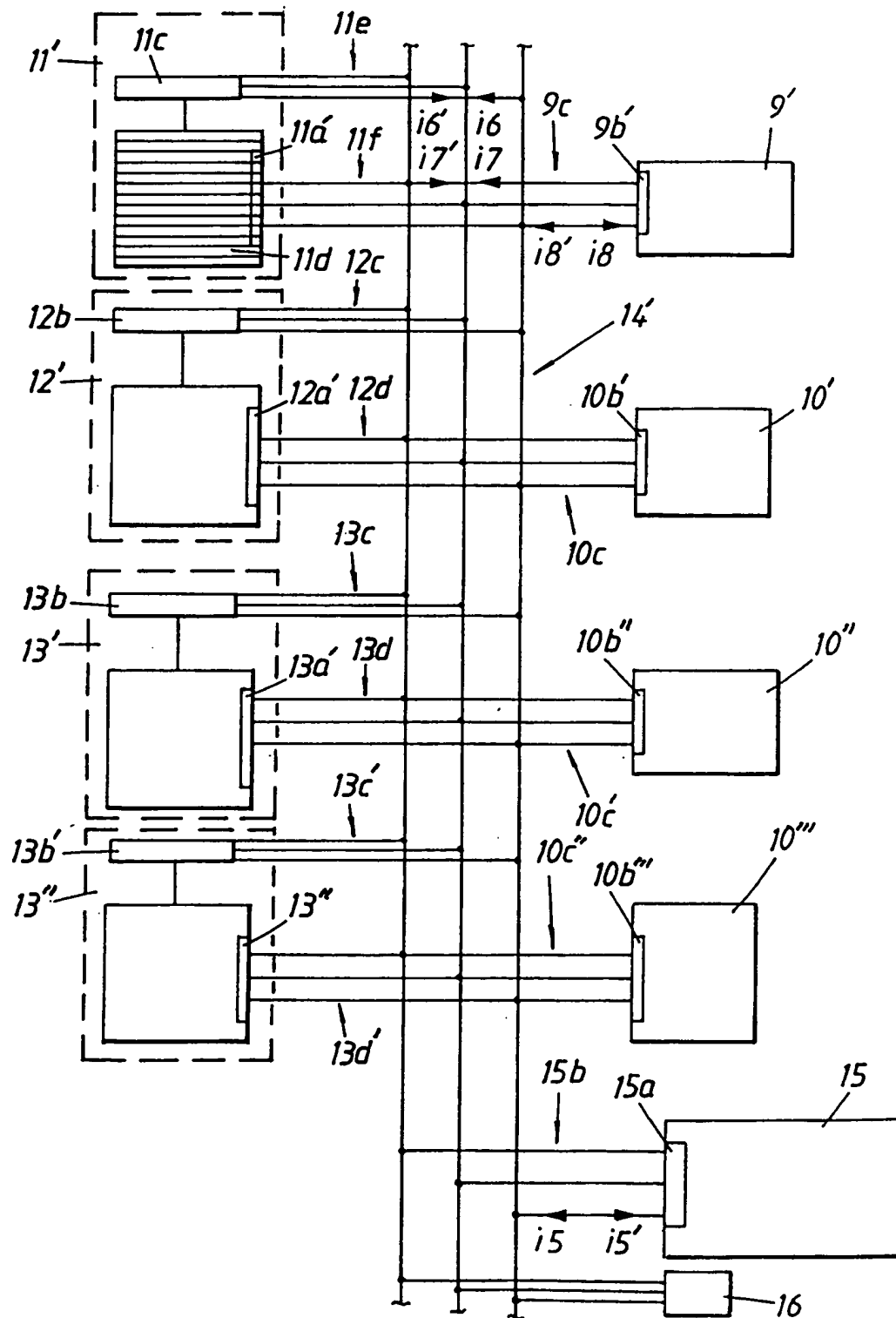


Fig. 2



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 9844865 A [0002]